

Computer model improves ultrasound image

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Doctors use diagnostic sonography or ultrasound to visualise organs and other internal structures of the human body. Dutch researcher Koos Huijssen has developed a computer model that can predict the sound transmission of improved designs for ultrasound instruments. The computer model is capable of processing large quantities of data and can be run on both a PC and a parallel supercomputer. Erasmus University Medical Centre and Oldelft Ultrasound are now using this program to design a new sonographic transducer.

Koos Huijssen went in search of a computer model that could predict the behaviour of ultrasonic waves. Over the past ten years, the images produced by ultrasound or sonography have been vastly improved by making partial use of the nonlinear nature of acoustic waves. Thanks to these developments ultrasound can now be used for a larger group of patients.

Further improvements could be realised by refining the sonography equipment, the transducer that generates the ultrasound and the imaging method. However, this requires a computer model that can accurately predict the transmission of ultrasound. With funding from Technology Foundation STW, Huijssen could develop a model which makes calculations over a three-dimensional area that is larger than existing computer models can handle.

The major challenges in producing such a model are the enormous complexity of the problem and dealing with the required storage capacity and processing power. The model was developed in cooperation with the company VORtech Computing and it has an excellent level of performance.

Source: Netherlands Organization for Scientific Research

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